

No. X continued west of the Mississippi, and moved southward, keeping company with the advance of the southernmost point of the area of cold northerly winds until the latter reached the Gulf of Mexico, after 11 p. m. of the 23rd. In general, the barometric troughs mark the region in which an area of cold air is meeting and under-running warmer air, and, accordingly, the eastward movement of low pressure No. X, during the rest of Friday night and early Saturday morning, marks the advance eastward along the west Gulf coast of the "severe norther" that began at Indianola at 12:35 a. m., Galveston 7:10 a. m., and New Orleans in the evening. By 11 p. m. of the 24th the lowest pressure, 29.80, had moved slightly northward into western Alabama, and the area of warm southerly winds was confined to the South Atlantic and East Gulf States, while cold northeast winds and steadily rising barometer extended from the Middle States and Lower Lakes northward over the St. Lawrence valley, where the pressure was then highest. By 4:35 p. m. of the 25th the central depression had diminished twenty-hundredths, and the attending winds and rains decidedly increased. The oval isobars had become more circular, and were central in eastern Georgia. From this time on the progress of the storm-centre, which had already been unusually slow, becomes the slowest of which we have any record over so long a period. It passed from Georgia steadily northeastward to the Gulf of St. Lawrence, occupying six days in its passage. The central lowest pressures were, 25th, 4:35 p. m., 29.55, in northeastern Georgia; 26th, 4:35 p. m., 29.30, in southeastern Virginia; 27th, 7:35 a. m., 29.30, in eastern New Jersey; 27th, 4:35 p. m., 29.20, east of New Jersey; 28th, 4:35 p. m., 29.05, southeastern Massachusetts; 29th, 4:35 p. m., 29.35, New Brunswick; 30th, 4:35 p. m., near Newfoundland; 31st, 4:35 p. m., east of Newfoundland. The brig George, from Maunabo, was in the centre of the storm from 8 a. m. of the 27th to after 4 p. m. of the 28th, while waiting to round Montauk Point. The brig Maggie Glen encountered the storm-centre on the 26th and 27th.

No. XI.—The maps of the 21st show that a depression was during that day east of Florida, moving northward toward the South Atlantic coast. During the 22nd the depression evidently passed northeastward very near Cape Hatteras. At 7:35 a. m., of 23rd, was off Cape Cod, at 4:35 p. m. was central in Nova Scotia, and by 11 p. m. had passed eastward beyond our stations. The brig George, from Maunabo to New London, encountered this storm on the 22nd when off the Carolina coast.

No. XII.—While low barometer No. X was, on the 24th, central in the Lower Mississippi valley, and high barometer No. XI was extending eastward, north of the Lake region, the pressure fell slightly at the Rocky Mountain stations and in Manitoba, and, on the afternoon of the 25th, the southern end of the depression extended southward over Minnesota. By the afternoon of the 26th the barometer had risen over the Upper Lakes, but had fallen in Nebraska and the Southwest. At 11 p. m. the depression was central in Kansas. At 7:35 a. m., 27th, it had moved southward into Indian Territory, while the barometer had risen rapidly to the northward. The central depression continued at the extreme southwestern limit of our stations until the afternoon of the 29th, by which time high barometer No. XII had moved southeastward to the Lakes, while the pressure had also been diminishing at all the Pacific coast and Rocky Mountain stations. Consequently, at 4:35 p. m. of the 29th, the isobar of 30.00 stretched from Manitoba southward over Texas, with a large region of low barometer to the westward, the greatest depression being probably in Wyoming or Idaho. During the next twenty-four hours pressure continued slowly falling between the Mississippi and Rocky Mountains, but rose on the Pacific coast, and at 4:35 p. m. of the 30th, the central depression was probably in southern Dakota; at 11 p. m. it had moved southward to Nebraska, but at 4:35 p. m., of 31st, was in the southeastern corner of Dakota, and at 11 p. m. in southern Minnesota. At this latter date the area of threatening and rainy weather covered the Middle States, Gulf States, Northwest and Lake region. The further history of the storm belongs to April.

Vessels Experiencing Storms.—Reports of storms at sea have been gathered from miscellaneous sources as follows: 1st, 35° 20' N., 63° 45' W., hurricane; from lat. 43° to 45° N., and long. 44° to 56° W., strong N. and W. gales. 2nd, from 34° N. to 45° N., off the Middle Atlantic coast, severe NE. to SE. gales. 9th, off the Middle Atlantic coast, SE. to SW. winds of hurricane force. 22nd, in 34° N. 74° W., a SE. gale, lasting 26 hours. 25th, 49° 32' N., 22° 23' W., strong gale and high sea. 27th, 32° 17' N., 78° 12' W., heavy NW. gale. 30th, off Cape Hatteras, heavy N. gale, lasting 34 hours.

TEMPERATURE OF THE AIR.

The general distribution of temperature for the month is shown by the isotherms upon chart No. II. As the temperatures here given depend entirely upon the observations made at the regular Signal Service and Canadian stations, they have, in the small table upon the same chart, been compared with the observations made at the same stations since their establishment in 1870 or subsequently. This comparison shows that the present month has been slightly warmer than during recent years throughout the Atlantic States and also on the Pacific coast, but has been slightly colder in the St. Lawrence valley, the Lake region, Ohio valley and Northwest. Reports from Newfoundland show the month to have been unusually warm in that region. The isotherm of 60° passes from southern Georgia along the East Gulf coast through southern Louisiana into Texas. The isotherm of 20° passes from the mouth of the St. Lawrence southwest to Lake Huron and thence west-

northwest to central Dakota. The average temperature at the summit of Pike's Peak was 12°, and at Mt. Washington, 11°.5. The mean for San Diego is 59° instead of 51°—whence the average for the whole Pacific coast is higher than the normal by about 3°.

Maximum and Minimum Temperatures.—The maxima above 80° were: 89° at Corsicana on the 16th; 87° Boerne, 14th; 84° Dodge City, 22nd; 83° Key West, 4th and 8th, Shreveport, 27th, and Fort Sill, 26th; 82° St. Marks, 28th; 81° Jacksonville, 28th, and Denison, 27th; 80° Punta Rassa, 5th; Fort Gibson, 27th. The maxima below 45° were: 31° at Pike's Peak on the 26th; 36° Mt. Washington, 27th and 28th; 43° Alpena, 29th, and Breckenridge, 28th and 31st; 44° Escanaba, 29th; 45° Pembina, 28th. The minima above 35° were: 58° Key West, 22nd; 50° Punta Rassa, 11th; 47° San Francisco, 31st; 39° Galveston, 9th, and New Orleans, 10th; 37° Indianola, 9th; 36° Jacksonville, 10th. The minima below —8° were: —22° at Pembina, 7th; —21° Mt. Washington, 19th; —14° Yankton, 8th, and Breckenridge, 24th; —10° Pike's Peak, 8th, and Alpena, 17th; —9° St. Paul, 9th, Escanaba, 20th, Virginia City, 3rd.

Ranges of Temperature.—Large diurnal ranges are reported as follows: Denver, 48°, Cheyenne, 41°.5th. Dodge City, 50°, 17th. Denison, 40°, 8th. Yankton, 38°, Leavenworth, 42°, Mt. Washington, 38°. 1st. The largest monthly ranges were 79° at Yankton; 77° at Dodge City; 75° at Denver; 73° at Omaha; 71° at Leavenworth; 57° at Mt. Washington. The smallest monthly ranges: 39° at Cape Hatteras and Eastport, 38° at New Orleans, 37° at Thatcher's Island, 36° at Galveston, 26° at San Francisco.

Frosts, as reported from Southern States, are as follows: *Alabama*, Carlsville on the 3rd, 6th, 7th, 10th, 11th, 15th, 16th, 18th, 22nd, 26th. *Arkansas*, at Mount Ida, very frequent, and Monticello on the 6th, 9th, 10th. *Florida*, at Milton, 6th, 7th, 23rd; Newport, 7th, 10th, 11th, 15th; Welborn, 11th; Mayport, 16th, 19th; Daytona, 19th. *Georgia*, St. Mary's, 7th, 11th, 18th, 19th. *Louisiana*, Point Pleasant, 6th, 10th, 18th. *Mississippi*, Brookhaven, 3rd, 6th, 10th, 18th, 22nd; Fayette, 6th, 10th, 18th, 22nd, 26th. *North Carolina*, Weldon, 11th, (heavy); Lenoir, 30th, (black frost.) *South Carolina*, Spartanburg, 6th, 7th, 10th, 30th, 31st. *Texas*, Clarksville, 4th, 5th, 6th, 8th, 9th, 10th, 17th, 25th; Melissa, 4th, 5th, 6th, 8th, 25th, Austin, 4th, 18th. *Virginia*, Hampton, 1st, 6th, 10th, 11th, 15th, 16th, 18th, 19th, 20th.

Ice.—The formation of ice in small rivers, ponds, &c., is reported as follows: *New York*, at Wappinger's Falls, pond ice, 6 inches thick, 1st; Vermillion, pond ice, 20 in. thick, at close of month. *Vermont*, Lauenburgh, pond ice, 20 in. thick, at close of month.

PRECIPITATION.

The general distribution of rain or melted snow is shown upon chart No. III, from which it will be seen that a large excess of rain has fallen over the Lower Lakes, St. Lawrence valley and New England. A deficiency is reported from the Western Gulf States and Upper Missouri. In other regions a slight excess has fallen.

Small monthly rainfalls.—Stations reporting very small rainfalls: Tucson, A. T. and Fort Hartsuff, Neb., 0.20; Camp Lowell, A. T., 0.19; Fort Larned, Kan., 0.18; Fort Bridger, Wyo., 0.16; Santa Fe, N. Mex. and Rio Grand, Tex., 0.14; South Pueblo, Colo., 0.13; Fort Sill, Ind. T. and Jacksboro, Tex., 0.11; Fort Garland, Colo., 0.16; Stanwix, A. T., 0.05 in.

Largest monthly rainfalls.—Stations reporting large monthly rainfalls are as follows: Worcester, Mass., 9.03; Mt. Desert, Me., 9.04; New Bedford, Mass., 9.05; Sandy Hook, N. Y., 9.09; Waltham, Mass., 9.35; Somerset, Mass., 9.43; Boston, Mass., 9.79; Newport, R. I., 10.02; Cape Hatteras, N. C., 10.41; Fort Warren, Mass., 10.48; Fall River, Mass., 10.58 and 10.73; Wood's Holl, Mass., 10.78; New London, Conn., 10.96; Portland, Or., 11.31; Mt. Washington, 11.64 inches.

Largest daily rains and snows.—In the rear of storm No. X heavy snows fell, thus in Luzerne Co., Penn., 18 inches fell on the 27th, 28th and 29th. The heaviest rains were: 1st, at Mobile, 3.26 inches, New Orleans, 3.02; 21st and 22nd, Kittyhawk, 3.48; 22nd and 23rd, Wood's Holl, 3.89; 22nd, Cape Hatteras, 3.60; 25th, Gainesville, Ga., 3.00; 25th and 26th, Spartanburg, S. C., 3.00; 26th, New London, 3.80; 26th and 27th, Springfield, Mass., 3.96, Sandy Hook, 3.94; 27th, Mt. Washington, 5.29.

Snowfall.—The general distribution of the monthly snow-fall was as follows: At various stations in Texas and Mississippi from 0.3 to 0.5 in.; in the eastern half of Colorado, and in Nebraska and Kansas, 1 to 5; Tennessee, South Carolina and Virginia, 0.3 to 7; Dakota and Minnesota, 11 to 15, in Iowa, Illinois, Indiana and Ohio varies from 1 to 32; along the Middle and East Atlantic coasts from 2 to 16; in the Lake region and on the west slope of the Alleghenies from 9 to 41. The highest figures reported are: 33 in. at Litchfield, Mich., and Madison, Wis.; 36 in. at Geneva, Wis.; 41 in. at Belvidere, Ill.

Depth of snow at close of month.—At exposed stations in New York, Michigan, Wisconsin and Minnesota there still laid on the ground from 2 to 8 inches.

Cloudy days.—The number of days upon which the cloudiness has averaged eight or more, on a scale